



Course code	BIO2004
Course title (English)	Biochemistry
Course title (Chinese)	生物化学
Units	3
Description (English)	<p>This course serves as a foundational exploration of biochemistry, offering fundamental knowledge and learning methods for students interested in biochemistry. It is a core requirement for students in related majors such as Biological Science, Bioinformatics, Pharmacy, and Chemistry. Prerequisites include prior coursework in general biology and general chemistry at the university level.</p> <p>The course topics encompass the structure and function of nucleic acids, protein structure and function, enzymology, cell membrane and signal transduction, carbohydrate metabolism, lipid metabolism, amino acid metabolism, and the regulation and integration of metabolism.</p>
Description (Chinese)	<p>本科目是为对生物化学感兴趣的学生提供生物化学基础知识和学习方法的基础课程，也是相关专业，如生物科学、生物信息学、药学和化学等的主要必修课程，要求已经在大学阶段学习了普通生物学、普通化学等相关课程。</p> <p>科目主题包括核酸的结构与功能、蛋白质结构与功能、酶学、细胞膜与信号转导、碳水化合物代谢、脂质代谢、氨基酸代谢、以及代谢的调控和整合等。</p>

Learning Outcomes

Knowledge:

- Students will understand the structures of macro-biomolecules and its building blocks.
- Students will understand the basic concepts of biochemical reactions and familiar with their executers.
- Students will understand the basic metabolic process of sugars, lipids, proteins and nucleic acid.
- Students will understand some basic concepts of DNA technology.

Skills Generic:

- Students will have the whole picture of chemical process in the living matters.
- Students will have the whole picture of genetic material structures and process in the living matters.
- Students will appreciate the importance of chemistry in real life.
- Students will be able to make better explanations on the basic biological phenomenon from biochemists or molecular biologists' view.

Valued/Attitude:

- Students will be equipped with biochemical and molecular biology knowledge and be able to communicate with others concerning matters in biology.



- j) Students will be more vigilant in some scientific issues and aware with the scientific development in the society.
- k) Students will have awareness of the impact of biochemistry and molecular biology in social, industrial, environmental and technological context.
- l) Students will be more literate in biological science. They will develop a knowledge in biological science so that they can disseminate related news articles.

Indicative Teaching Plan

Week	Content/ topic/ activity
1	The Chemical Foundation of Biochemistry
2	Nucleic acids
3	Proteins I: An Introduction to Protein Structure, Function and Purification
4	Proteins I; Proteins II: Enzymes, Allosterism and Receptor-ligand Interactions
5	Proteins II
6	Membranes and an Introduction to Signal Transduction
7	Mid-term exam
8	Carbohydrates I: Mono- and Disaccharides, Glycolysis, Gluconeogenesis, and the Fates of Pyruvate
9	Carbohydrates I; The Common Catabolic Pathway
10	The Common Catabolic Pathway; Carbohydrates II
11	Carbohydrates II; Lipids I: Fatty Acids, Steroids, and Eicosanoids; Beta-Oxidation and Fatty Acid Biosynthesis
12	Lipids I; Lipids II: Metabolism and Transport of Complex Lipids
13	Amino Acid and Amine Metabolism
14	Regulation and Integration of Metabolism